Amendments to the Claims

Claim 1 (original): A method of performing an expression microarray to determine the presence of a target, comprising:

(a) attaching a probe which will recognize a target to a polymer-coated support by a [2 + 2] photocycloaddition to form a microarray;

(b) contacting an aqueous target solution with the microarray, for a time sufficient to form a complex between complementing targets and probes, wherein the target solution comprises an aqueous buffer solution and the target; and

(c) scanning the microarray to determine the presence of the target.

Claim 2 (original): The method of claim 1, further comprising application of a probe standard to the polymer-coated support.

Claim 3 (original): The method of claim 2, wherein the probe and probe standard are applied to the polymer-coated support in about equal amounts, on a weight basis.

Claim 4 (original): The method of claim 2, wherein said aqueous target solution further comprises a target standard.

Claim 5 (original): The method of claim 1, wherein the concentration of the target is determined through comparison of the fluorescence intensities of the target and target standard.

Claim 6 (currently amended): The method of claim 4, wherein the target standard is selected from the group consisting of yeast mRNA and bacterial mRNA, ~~or~~and combinations thereof.

Claim 7 (original): The method of claim 1, wherein scanning occurs in a spectrometer capable of measuring and recording fluorescence intensity and position.

Claim 8 (original): The method of claim 1, wherein the aqueous target solution comprises a buffer capable of maintaining pH from about 6 to 9.

Claim 9 (original): The method of claim 1, wherein the target is a labeled nucleic acid.

Claim 10 (original): The method of claim 9, wherein the label is selected from the group consisting of Cy-3, Cy-5, Cy-5.5, and ALEXA FLUOR.

Claim 11 (original): The method of claim 9, wherein the label is Cy-3.

Claim 12 (currently amended): The method of claim 9, wherein the labeled nucleic acid is mRNA, RNA, DNA, amplified RNA, amplified DNA, ~~or~~and modifications thereof.

Claim 13 (original): The method of claim 9, wherein the labeled nucleic acid is mRNA, RNA, or DNA.

Claim 14 (original): The method of claim 1, further comprising developing of the microarray after application of the target solution.

Claim 15 (original): The method of claim 14, wherein developing lasts from 1 minute to 42 hours.

Claim 16 (original): The method of claim 14, wherein developing lasts about 16 hours.

Claim 17 (original): The method of claim 14, wherein developing occurs between 30 and 45° C.

Claim 18 (original): The method of claim 14, wherein developing occurs at about 37° C.

Claim 19 (original): The method of claim 14, further comprising washing with an aqueous wash after developing.

Claim 20 (original): The method of claim 19, wherein the aqueous wash contains a buffer capable of maintaining pH from about 6 to 9.

Claim 21 (original): The method of claim 20, wherein the buffer comprises phosphate and sodium chloride.

Claim 22 (currently amended): The method of claim 1, wherein the solid support is a material selected from the group consisting of nylon, polystyrene, glass, latex, polypropylene, and activated cellulose, ~~or~~and combinations thereof.

Claim 23 (original): The method of claim 1, wherein the solid support is glass.

Claim 24 (original): The method of claim 1, wherein the polymer is a polymer, reactive prepolymer, or copolymer made of at least two co-monomers wherein at least one of said co-monomers can undergo [2 + 2] photocycloaddition.

Claim 25 (original): The method of claim 24, wherein the polymer or reactive prepolymer contains polyacrylamide.

Claim 26 (original): The method of claim 1, wherein the polymer is a polymer, reactive prepolymer, or copolymer chemically modified to contain a reactive group that undergoes [2 + 2] photocycloaddition.

Claim 27 (original): The method of claim 26, wherein the polymer or reactive prepolymer contains polyacrylamide.

Claim 28 (original): The method of claim 1, wherein said probe comprises a nucleic acid fragment containing less than about 1000 nucleotides, and further optionally comprises a linker.

Claim 29 (original): The method of claim 28, wherein said linker is an organic chain of about 6 to 100 atoms in length.

Claim 30 (currently amended): The method of claim 28, wherein said nucleic acid fragment is selected from the group consisting of synthetic nucleotides and modified nucleotides, ~~or~~and combinations thereof.

Claim 31 (original): The method of claim 1, wherein said probe is cDNA.

Claim 32 (original): The method of claim 1, wherein said probe is chemically modified to contain a reactive group that undergoes [2 + 2] photocycloaddition.

Claim 33 (original): The method of claim 32, wherein said probe is chemically modified with a phosphoramidite.

Claim 34 (original): The method of claim 33, wherein said phosphoramidite is chemically functionalized with a reactive site capable of undergoing [2 + 2] photocycloaddition.

Claim 35 (original): The method of claim 33, wherein said phosphoramidite is functionalized with a cinnamide.

Claim 36 (original): The method of claim 1, wherein said probe inherently contains a reactive site that undergoes [2 + 2] photocycloaddition.

Claim 37 (currently amended): The method of ~~claim 1~~claim 34, wherein ~~the reactive site present on the polymer and/or~~ the reactive site present on the probe(s) contains an alkene group.

Claim 38 (currently amended): The method of claim 1, wherein the reactive site present on the polymer and/or the reactive site present on the probe is selected from the group consisting of dimethyl maleimide, maleimide, thymine, polythymine, acrylate, cinnamate, and citraconimide, ~~or~~and combinations thereof.

Claim 39 (original): The method of claim 1, wherein the polymer coated support is a hydrogel microarray.

Claim 40 (original): The method of claim 39, wherein the microarray is formed by crosslinking a hydrogel simultaneous with step (a).

Claim 41 (original): The method of claim 39, wherein prior to step (a) the hydrogel microarray is prepared by first crosslinking a hydrogel.

Claim 42 (original): The method of claim 1, wherein a photosensitiser is added during step (a).

Claim 43 (original): The method of claim 42 wherein, the photosensitiser is Anthroquinone-2-sulfonic acid.

Claim 44 (original): A method of performing a single nucleotide polymorphism microarray to determine the presence of a target, comprising:

(a) attaching a probe which will recognize a target to a polymer-coated support by a [2 + 2] photocycloaddition to form a microarray;

(b) contacting an aqueous target solution with the microarray, for a time sufficient to form a complex between complementing targets and probes, wherein the target solution comprises an aqueous buffer solution, the target, an active enzyme, and a labeled carrier; and

(c) scanning the microarray to determine the presence of the target.

Claim 45 (original): The method of claim 44, further comprising application of a probe standard to the polymer-coated support.

Claim 46 (original): The method of claim 45, wherein the probe and probe standard are applied to the polymer-coated support in about equal amounts, on a weight basis.

Claim 47 (original): The method of claim 45, wherein said aqueous target solution further comprises a target standard.

Claim 48 (original): The method of claim 44, wherein the concentration of the target is determined through comparison of the fluorescence intensities of the target and target standard.

Claim 49 (currently amended): The method of claim 47, wherein the target standard is selected from the group consisting of yeast mRNA and bacterial mRNA, ~~or~~and combinations thereof.

Claim 50 (original): The method of claim 44, wherein scanning occurs in a spectrometer capable of measuring and recording fluorescence intensity and position.

Claim 51 (original): The method of claim 44, wherein the aqueous target solution comprises a buffer capable of maintaining pH from about 6 to 9.

Claim 52 (original): The method of claim 44, wherein the aqueous target solution comprises an active enzyme.

Claim 53 (original): The method of claim 52, wherein the active enzyme is capable of transferring a label to a probe/target complex by single base extension.

Claim 54 (original): The method of claim 52, wherein the active enzyme is thermosequanase.

Claim 55 (original): The method of claim 44, wherein the aqueous target solution comprises a fluorescently labeled carrier.

Claim 56 (original): The method of claim 55, wherein the fluorescently labeled carrier provides a transferable label to an active enzyme for transfer to a probe/target complex by single base extension.

Claim 57 (original): The method of claim 55, wherein the fluorescently labeled carrier is di-deoxynucleotide triphospahte.

Claim 58 (original): The method of claim 55, wherein the label is selected from the group consisting of Cy-3, Cy-5, Cy-5.5, and ALEXA FLUOR.

Claim 59 (original): The method of claim 55, wherein the label is Cy-3.

Claim 60 (original): The method of claim 44, wherein the target is a nucleic acid.

Claim 61 (currently amended): The method of claim 60, wherein the nucleic acid is mRNA, RNA, DNA, amplified RNA, amplified DNA, ~~or~~and modifications thereof.

Claim 62 (original): The method of claim 60, wherein the nucleic acid is mRNA, RNA, or DNA.

Claim 63 (original): The method of claim 44, further comprising developing of the microarray after application of the target solution.

Claim 64 (original): The method of claim 63, wherein developing lasts for 30 to 60 heating/cooling cycles.

Claim 65 (original): The method of claim 63, wherein developing lasts for 40 to 50 heating/cooling cycles.

Claim 66 (original): The method of claim 63, wherein developing occurs between 30 and 70° C.

Claim 67 (original): The method of claim 63, wherein developing occurs between 40 and 60° C.

Claim 68 (original): The method of claim 63, further comprising washing with an aqueous wash after developing.

Claim 69 (original): The method of claim 68, wherein the aqueous wash is performed between 40 and 70° C.

Claim 70 (original): The method of claim 68, wherein the aqueous wash is performed between 50 and 60° C.

Claim 71 (original): The method of claim 68, wherein the aqueous wash contains a buffer capable of maintaining pH from about 6 to 9.

Claim 72 (original): The method of claim 71, wherein the buffer comprises phosphate and sodium chloride.

Claim 73 (currently amended): The method of claim 44, wherein the solid support is a material selected from the group consisting of nylon, polystyrene, glass, latex, polypropylene, and activated cellulose, ~~or~~and combinations thereof.

Claim 74 (original): The method of claim 44, wherein the solid support is glass.

Claim 75 (original): The method of claim 44, wherein the polymer is a polymer, reactive prepolymer, or copolymer made of at least two co-monomers wherein at least one of said co-monomers can undergo [2 + 2] photocycloaddition.

Claim 76 (original): The method of claim 75, wherein the polymer or reactive prepolymer contains polyacrylamide.

Claim 77 (original): The method of claim 44, wherein the polymer is a polymer, reactive prepolymer, or copolymer chemically modified to contain a reactive group that undergoes [2 + 2] photocycloaddition.

Claim 78 (original): The method of claim 77, wherein the polymer or reactive prepolymer contains polyacrylamide.

Claim 79 (original): The method of claim 44, wherein said probe comprises a nucleic acid fragment containing less than about 1000 nucleotides, and further optionally comprises a linker.

Claim 80 (original): The method of claim 79, wherein said linker is an organic chain of about 6 to 100 atoms in length.

Claim 81 (currently amended): The method of claim 79, wherein said nucleic acid fragment is selected from the group consisting of synthetic nucleotides and modified nucleotides, ~~or~~and combinations thereof.

Claim 82 (original): The method of claim 44, wherein said probe is cDNA.

Claim 83 (original): The method of claim 44, wherein said probe is chemically modified to contain a reactive group that undergoes [2 + 2] photocycloaddition.

Claim 84 (original): The method of claim 83, wherein said probe is chemically modified with a phosphoramidite.

Claim 85 (original): The method of claim 84, wherein said phosphoramidite is chemically functionalized with a reactive site capable of undergoing [2 + 2] photocycloaddition.

Claim 86 (original): The method of claim 84, wherein said phosphoramidite is functionalized with a cinnamide.

Claim 87 (original): The method of claim 44, wherein said probe inherently contains a reactive site that undergoes [2 + 2] photocycloaddition.

Claim 88 (currently amended): The method of ~~claim 44~~claim 83, wherein ~~the reactive site present on the polymer and/or~~ the reactive site present on the probe(s) contains an electron deficient alkene group.

Claim 89 (original): The method of claim 44, wherein the reactive site present on the polymer and/or the reactive site present on the probe is selected from the group consisting of dimethyl maleimide, maleimide, thymine, polythymine, acrylate, cinnamate, and citraconimide, or combinations thereof.

Claim 90 (original): The method of claim 44, wherein the polymer coated support is a hydrogel microarray.

Claim 91 (original): The method of claim 90, wherein the microarray is formed by crosslinking a hydrogel simultaneous with step (a).

Claim 92 (original): The method of claim 90, wherein prior to step (a) the hydrogel microarray is prepared by first crosslinking a hydrogel.

Claim 93 (original): The method of claim 44, wherein a photosensitiser is added during step (a).

Claim 94 (original): The method of claim 93 wherein, the photosensitiser is Anthroquinone-2-sulfonic acid.